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NEW COMPLEXES OF 2-(1H-1, 2, 4-TRIAZOL-3-YL) PYRIDINE WITH Co(II), Cd(II), Rh(III), IONS: SYNTHESIS, STRUCTURE, PROPERTIES AND POTENTIAL APPLICATIONS

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Abstract

Co(II), Cd(II) and Rh(III) complexes with 2-(1H-1,2,4-triazol-3-yl)pyridine (Htzp) as ligand were synthesized and investigated. The neutral mononuclear complexes with a generic [M(tzp)n] structure have been prepared from Htzp and corresponding transition metals chlorides at 2:1 and 3:1, respectively molar ratios in H_2O–EtOH. The resulted crystalline complexes were investigated through magnetic and molar conductivity measurements, elemental analysis, FT-IR, mass spectroscopy, thermal analysis, UV-Vis and P-XRD. The experiments indicate that Htzp acts as bidentate anionic ligand, $[Co(tzp)2]\cdot 1.5H_2O$ and $[Cd(tzp)_2]$ are in the tetragonal coordination, whereas six coordinate octahedral $[Rh(tzp)_3]\cdot H_2O$ complex undergoes a weak tetragonal distortion. In case of Co(II) complex, an interesting feature was revealed through fluorescence spectroscopy, as the fluorescent emission intensity of the free ligand is dependent on the Co(II) solution content. Through complexation, the fluorescence is gradually quenched according to the Co(II) aqueous solution content, which may recommend it as a method of detection of Co(II) presence in waste water.

Key words: Co(II) detection, ligand, transition metal complexes, triazole complexes

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